Trend Study 25C-27-98

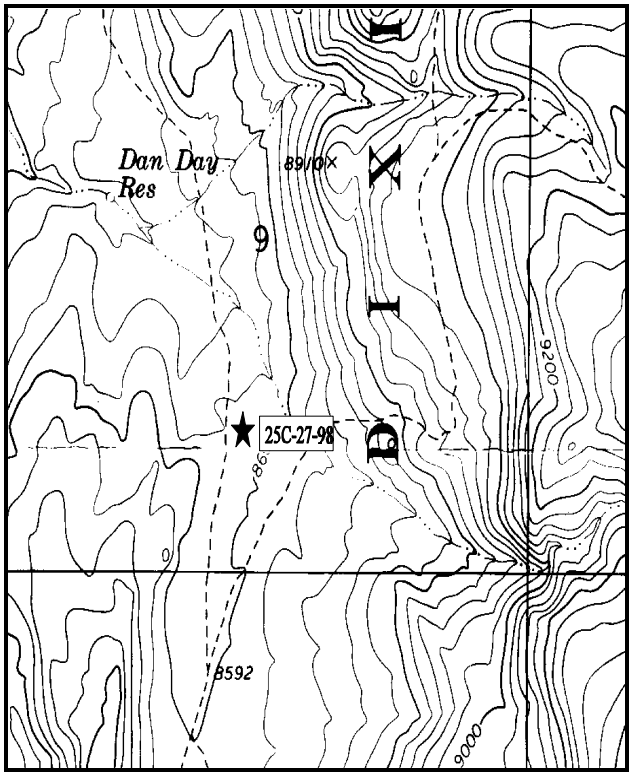
Study site name: Poison Creek Bench . Range type: Big Sagebrush .

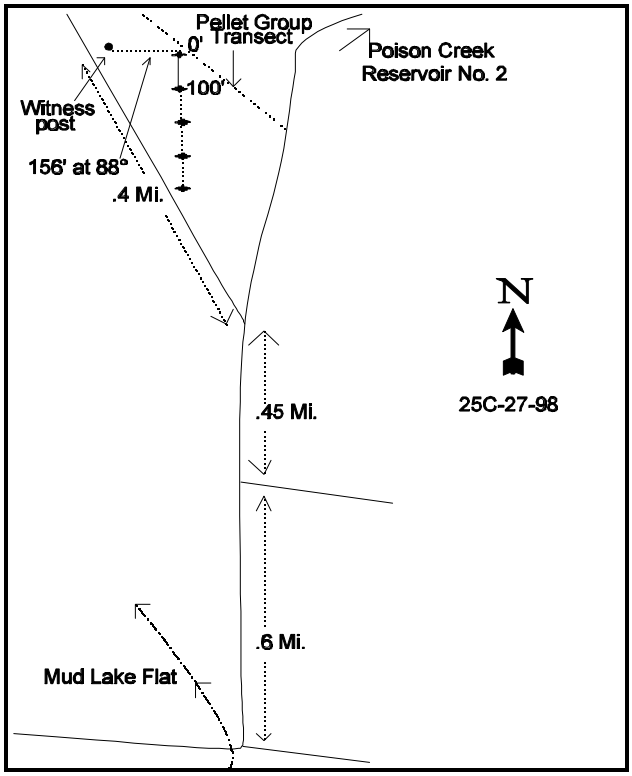
Compass bearing: frequency baseline 180 degrees.

Footmark (first frame at) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line4 (71ft).

LOCATION DESCRIPTION

From the Center Creek study site (25C-25-98), continue north on the main road for 2.3 miles to the Mud Lake/Pacer Lake fork. Continue straight on the main road for 0.4 miles to a fork near an intermittent stream and turn right. This area can also be reached by coming from the north along the Poison Creek and Mud Lake roads. Drive 0.6 miles to a fork. Proceed straight through the fork for 0.45 miles to another fork. Bear left and proceed 0.4 miles to the study site, identified by a witness post on the right side of the road. The 0-foot baseline stake is about 30 paces east of the witness post. The 2-foot metal fencepost has a browse tag, #9001, attached.





Map Name: Antimony Diagrammatic Sketch

Township 32S , Range 1W , Section 9 UTM 4209788.044 N, 420665.871 E

DISCUSSION

Trend Study No. 25C-27 (44-27)

The Poison Creek Bench trend study samples high elevation winter range on the west side of the unit which appears to receive substantial use by deer in the winter. The bench where the study is located is dominated by mountain big sagebrush. Surrounding ridges support aspen, Rocky Mountain juniper, and ponderosa pine. The bench slopes gently, 1-2% to the west-northwest with an elevation of 8,600 feet. Pellet group data from 1998 estimate 11 deer, 1 elk, and 11 cow days use/acre. Most of the deer pellet groups appear fresh indicating that deer use this area during for summer as well as winter range. After the reading in 1994, the area was part of a prescribed burn.

Soil at the site is very rocky on the surface and in the profile. Effective rooting depth (see methods) is estimated at just over 13 inches. Texture is a sandy clay loam with a moderately acid pH (6.0). There is little bare ground exposed due to the abundant vegetation and litter cover. The small areas that are exposed have a protective covering of pavement. Overall, the hazard of erosion is minimal.

Ten browse species occurred on the site including a dense stand of vigorous mountain big sagebrush. Data from the density plots taken in 1987 indicate a stand of 8,398 plants/acre which has remained fairly stable. During the 1994 reading, a total of 6,760 sagebrush plants/acre were estimated. Most of the decrease in density was the result of the much larger sample taken in 1994, which gives much better population estimates for browse species. Twenty-five percent of the population was classified as young in 1987, 22% in 1991, and 17% in 1994. The biotic potential was also high in 1987 at 21%. Biotic potential has since fallen to 10% in 1991. Ten percent of the larger plants showed heavy hedging in 1987 with utilization being more moderate in 1991 (2%) and 1994 (9%). The majority of the sagebrush are only lightly used. Percent decadency has remained similar at around 20% with the exception of 37% in 1991.

The less common bitterbrush have steadily increased in density from 1,332 plants/acre in 1987 to 2,280 by 1994. They show heavier use than sagebrush with 70% of the large, bushy plants heavily hedged in 1987. In 1991, only 26% of the shrubs were heavily hedged, however, nearly half displayed poor vigor and decadency was extremely high at 83%. By 1994, only 4% of the shrubs displayed heavy use, no plants were classified with poor vigor and percent decadency dropped to only 17%. Bitterbrush has shown a lower biotic potential since 1987 and reduced number of young plants. However, the population increased with each reading.

Rubber rabbitbrush was fairly common in 1987 with a high proportion being seedlings and young which appeared to be unutilized. Since that reading, the population has increased slightly from 732 plants/acre in 1987, to 799 plants/acre in 1991, and 740 plants/acre in 1994. Utilization was heavier in 1991. No seedlings were encountered and half as many young plants were counted during the 1991 reading. Percent decadency also increased from 27% in 1987 to 42% in 1991, with the decadent individuals being utilized the most. During the 1994 reading, only a few seedlings and young were found, but no decadent plants were encountered.

Some time after the 1994 reading, a fire burned the area eliminating most of the shrubs. During the 1998 reading, only 1,280 sagebrush plants/acre were estimated. Mature and decadent plants numbered 820 plants/acre. Dead plants consisting of burned stems numbered an estimated 3,960 per acre. It was difficult to determine if the stems were from sagebrush or bitterbrush. Utilization of sagebrush is light to moderate and vigor normal on most plants. Seedlings and young are numerous and the population will likely increase in the future. Nearly all of the bitterbrush was eliminated by the fire and only 40 young plants/acre remain. All of the rubber rabbitbrush was killed by the fire, but the sprouting stickyleaf low rabbitbrush increased slightly since 1994 from 1,920 to 2,520 plants/acre.

The herbaceous understory was quite diverse and productive even before the fire. Prior to the fire the most abundant grasses included: Letterman needlegrass, bottlebrush squirreltail, mutton bluegrass, a sedge, and blue

grama. After the fire production of perennial grasses doubled, but composition remained similar. The most common species is currently a Carex species which provides 49% of the grass cover. Blue grama, mutton bluegrass, bottlebrush squirreltail, needle-and-thread and Letterman needlegrass are also common. It is not known if the site was seeded after the fire, but crested wheatgrass and intermediate wheatgrass were encountered in one of the 100 quadrats in 1998. Forbs are especially diverse. Twenty-eight species were identified on the transect in 1994. As with the grasses, utilization was very light. Only the tall narrowleaf paintbrush, a few penstemon, and buckwheat showed any signs of use. Composition remained similar after the fire with 30 species classified in 1998, including many preferred and valuable as forage. Currently, the most common species include: Indian paintbrush, redroot and sulfur eriogonum, Utah deervetch, silvery lupine, and Uinta groundsel. Sum of nested frequency of forbs had been declining steadily since 1987, but has rebounded after the burn. Production also increased dramatically from 3% cover estimated in 1994 to 16% by 1998.

1991 TREND ASSESSMENT

Basic cover features are almost the same except for the decline in vegetative basal cover which dropped from 12% to 8%. Rock-pavement cover has not really changed (39% to 40%) and litter cover has only increased slightly (44% to 45%). The most critical parameter, percent bare ground, only changed from 5% to 7%. Percent bare ground is still very low when compared to most sites. Trend for Poison Creek Ridge is stable. The two key browse species for the site are mountain big sagebrush and antelope bitterbrush. The mountain big sagebrush population has not shown any significant changes since 1987. It decreased by less than 1%. Rate of decadency has risen from 22% to 37%. This should be monitored closely to see if any significant losses should occur in the future. This rate of decadency should be expected with such a high density (8,332 plants/acre) in association with the extended drought we have been in since 1987. Antelope bitterbrush has actually experienced a 13% increase in it's numbers (1,332 to 1,532), but it too has demonstrated increases in percent decadency (20% to 83%). A high rate of decadency for bitterbrush has been found on many sites throughout Utah and would be expected to decrease with an end to this unusually long drought. Trend for key browse is stable to slightly declining, depending on future trends in decadence. The herbaceous understory is a little more difficult to determine since the grasses are slightly increasing while the forbs are declining. Since this area is considered a winter range for big game, the grass component is weighted more heavily, making the trend stable at this time.

TREND ASSESSMENT
soil - stable
browse - stable to slightly declining
herbaceous understory - stable

1994 TREND ASSESSMENT

Ground cover characteristics are similar to those of 1987, however percent bare ground has steadily increased from 5% in 1987 to 9% by 1994, and pavement cover declined. The trend for soil is still stable due to the abundance of herbaceous vegetation. Percent bare ground will likely decline with the return of normal precipitation patterns. Trend for browse is up slightly. Density of mountain big sagebrush declined 19% due primarily to a reduction in the number of young and decadent plants. Density of mature plants increased from 3,400 to 4,220 plants/acre. Percent decadence has declined from 37% to 21%. Trend for the other key species, antelope bitterbrush, is up due to decreased decadency, improved vigor and a gradual increase in density. However, biotic and reproductive potentials are low. Trend for the herbaceous understory is down slightly due to declining sum of nested frequencies of forbs and grasses. Nested frequencies of forbs declined 40% while those of grasses declined nearly 17%.

TREND ASSESSMENT
soil - stable
browse - up slightly
herbaceous understory - down slightly

1998 TREND ASSESSMENT

Trend for soil is considered stable. Percent bare ground increased from 9% to 14% and litter declined from 44% to 30% due to the fire. However, vegetation cover increased and herbaceous cover currently provides 87% of that cover. Trend for browse is down due to the fire. Some sagebrush appears to have survived the fire and current population density is estimated at 1,280 plants/acre. Biotic potential is 8% and young plants account for 36% of the population. Most of the bitterbrush appear to have been eliminated and only 40 young plants/acre remain on the site. The increaser, stickyleaf low rabbitbrush, has increased 24% since 1994. Trend for the herbaceous understory is up. Sum of nested frequency of grasses and forbs has increased. Production has also increased especially for forbs which are an important component of big game spring range. Pellet group data suggest that this area is currently used more in the spring and summer than in winter.

TREND ASSESSMENT
soil - stable
browse - down due to the fire
herbaceous understory - up

HERBACEOUS TRENDS --
Herd unit 25C, Study no: 27

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'87	'91	'94	'98	'87	'91	'94	'98	'94	'98
G	Agropyron cristatum	-	-	-	3	-	-	-	1	-	.03
G	Agropyron intermedium	-	-	-	1	-	-	-	1	-	.00
G	Bouteloua gracilis	$_{b}$64	$_{b}$73	$_{a}$37	$_{a}$33	23	29	16	14	1.07	1.01
G	Bromus inermis	8	-	-	-	2	-	-	-	-	-
G	Bromus japonicus (a)	-	-	-	-	-	-	-	-	-	.00
G	Carex spp.	$_{a}$36	$_{a}$48	$_{b}$130	$_{c}$175	17	17	47	56	2.08	11.49
G	Koeleria cristata	6	9	14	5	3	5	6	3	.10	.06
G	Poa fendleriana	84	69	81	55	38	32	32	25	2.15	1.56
G	Sitanion hystrix	$_{b}$160	$_{b}$158	$_{a}$76	$_{a}$100	72	68	38	48	.78	2.99
G	Stipa columbiana	$_{a}$-	$_{a}$-	$_{a}$-	$_{b}$24	-	-	-	8	-	.95
G	Stipa comata	$_{a}$-	$_{c}$35	$_{b}$8	$_{c}$59	-	18	4	25	.36	2.41
G	Stipa lettermani	$_{b}$147	$_{b}$149	$_{a}$106	$_{a}$82	69	66	42	34	3.65	2.75
Total Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total Perennial Grasses		505	541	452	537	224	235	185	215	10.21	23.28
F	Agoseris glauca	-	1	-	-	-	1	-	-	-	-
F	Antennaria parvifolia	$_{c}$25	$_{bc}$19	$_{a}$-	$_{ab}$5	15	7	-	2	-	.06
F	Androsace septentrionalis (a)	-	-	$_{a}$3	$_{b}$30	-	-	2	16	.01	.28

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'87	'91	'94	'98	'87	'91	'94	'98	'94	'98
F	Arabis demissa	$_{b}$53	$_{ab}$27	$_{a}$11	$_{a}$14	25	14	5	6	.02	.08
F	Artemisia ludoviciana	2	-	1	1	1	-	1	1	.00	.03
F	Astragalus convallarius	13	8	9	17	8	5	4	9	.10	.24
F	Astragalus spp.	3	-	4	-	1	-	2	-	.01	-
F	Castilleja linariaefolia	$_{b}$69	$_{a}$33	$_{a}$24	$_{a}$36	33	19	12	20	.32	1.11
F	Chaenactis douglasii	$_{b}$63	$_{a}$8	$_{a}$2	$_{a}$10	33	4	2	5	.01	.07
F	Crepis acuminata	-	3	-	5	-	2	-	3	-	.04
F	Cryptantha flavoculata	$_{a}$5	$_{b}$20	$_{a}$5	$_{a}$-	2	10	3	-	.01	-
F	Cruciferae	-	2	-	-	-	2	-	-	-	-
F	Descurainia pinnata (a)	-	-	-	8	-	-	-	3	-	.04
F	Erigeron eatonii	$_{b}$72	$_{b}$79	$_{a}$11	$_{a}$26	34	41	6	10	.05	.49
F	Erigeron pumilus	$_{b}$37	$_{ab}$32	$_{a}$16	$_{ab}$22	19	17	9	12	.14	.43
F	Eriogonum racemosum	$_{b}$67	$_{b}$68	$_{a}$38	$_{ab}$37	32	31	19	19	.21	.72
F	Eriogonum umbellatum	$_{b}$35	$_{ab}$38	$_{ab}$29	$_{a}$12	17	16	16	7	.25	.58
F	Gilia spp. (a)	$_{b}$23	$_{a}$-	$_{a}$5	$_{a}$-	10	-	2	-	.01	-
F	Hymenoxys richardsonii	5	7	3	3	2	2	1	2	.03	.15
F	Ipomopsis aggregata	1	4	5	7	1	2	4	4	.02	.36
F	Linum lewisii	6	7	2	3	2	3	1	2	.00	.04
F	Lotus utahensis	$_{b}$118	$_{a}$28	$_{a}$60	$_{a}$33	55	16	25	18	.22	1.35
F	Lupinus argenteus	$_{b}$101	$_{a}$59	$_{ab}$72	$_{a}$63	43	27	33	28	1.46	6.75
F	Lychnis drummondii	$_{a}$-	$_{b}$12	$_{a}$-	$_{ab}$8	-	6	-	3	-	.06
F	Lygodesmia spinosa	10	13	2	6	6	7	2	3	.06	.09
F	Machaeranthera canescens	$_{b}$26	$_{ab}$13	$_{a}$7	$_{a}$1	11	8	4	1	.07	.03
F	Microsteris gracilis (a)	-	-	-	2	-	-	-	1	-	.03
F	Orthocarpus spp. (a)	-	-	3	-	-	-	1	-	.00	-
F	Penstemon comarrhenus	$_{b}$17	$_{a}$6	$_{a}$3	$_{ab}$16	12	5	1	6	.00	.05
F	Petradoria pumila	2	3	2	1	2	2	1	1	.03	.00
F	Phlox longifolia	$_{b}$67	$_{b}$65	$_{a}$16	$_{a}$12	33	34	7	7	.04	.06
F	Potentilla anersina	6	3	2	1	2	1	2	1	.03	.01
F	Senecio multilobatus	$_{c}$108	$_{a}$23	$_{a}$15	$_{b}$73	53	14	9	33	.04	2.23
F	Taraxacum officinale	$_{ab}$7	$_{ab}$4	$_{a}$-	$_{b}$5	3	2	-	4	-	.05
F	Unknown forb-perennial	2	-	-	-	1	-	-	-	-	-
F	Veronica biloba (a)	-	-	-	3	-	-	-	1	-	.15
Total Annual Forbs		3	0	11	43	10	0	5	21	0.02	0.50
Total Perennial Forbs		940	585	339	417	446	298	169	207	3.20	15.13

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 25C, Study no: 27

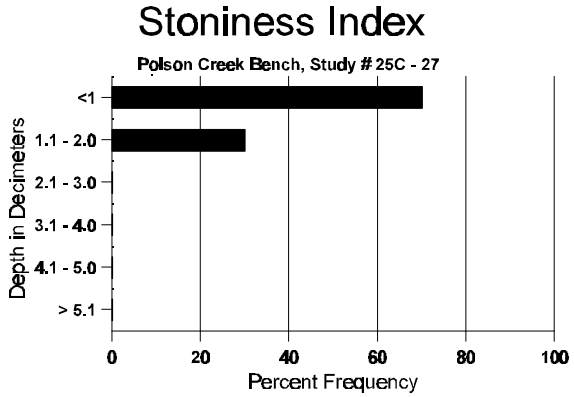
Type	Species	Strip Frequency '94	Strip Frequency '98	Average Cover % '94	Average Cover % '98
B	Artemisia nova	7	0	1.84	-
B	Artemisia tridentata vaseyana	98	23	20.42	2.53
B	Cercocarpus ledifolius	0	1	-	-
B	Chrysothamnus nauseosus	19	0	.20	-
B	Chrysothamnus viscidiflorus	47	58	.46	2.99
B	Echinocereus spp.	0	10	-	.03
B	Gutierrezia sarothrae	4	6	-	.01
B	Juniperus scopulorum	0	0	.15	-
B	Leptodactylon pungens	13	2	.36	.00
B	Opuntia spp.	4	0	.05	-
B	Purshia tridentata	32	2	8.53	.18
B	Symphoricarpos oreophilus	1	0	-	-
B	Tetradymia canescens	3	6	.00	.00
Total for Browse		228	108	32.02	5.76

BASIC COVER --
Herd unit 25C, Study no: 27

Cover Type	Nested Frequency '94	Nested Frequency '98	Average Cover % '87	Average Cover % '91	Average Cover % '94	Average Cover % '98
Vegetation	312	334	11.75	7.50	42.77	51.95
Rock	285	193	20.50	13.75	18.45	9.80
Pavement	246	344	18.75	26.50	3.72	21.64
Litter	379	367	44.25	45.00	43.79	30.38
Cryptogams	20	5	.25	.25	.12	.01
Bare Ground	234	203	4.50	7.00	8.98	13.82

SOIL ANALYSIS DATA --
Herd Unit 25C, Study # 27, Study Name: Poison Creek Bench

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
13.1	60.2 (15.1)	6.0	54.0	27.4	18.6	5.4	35.2	313.6	.5



PELLET GROUP FREQUENCY --
Herd unit 25C, Study no: 27

Type	Quadrat Frequency '94	'98
Rabbit	21	9
Elk	-	1
Deer	30	19
Cattle	5	3

BROWSE CHARACTERISTICS --
Herd unit 25C, Study no: 27

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia nova																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	12	2	-	-	-	-	-	-	-	14	-	-	-	280	6	18	14
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	8	4	-	-	-	-	-	-	-	1	-	-	11	240			12
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'91	00%	00%	00%
'94	23%	00%	42%
'98	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	0%
	'91	0		0%
	'94	520		46%
	'98	0		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	87	27	-	-	-	-	-	-	-	-	27	-	-	-	1800			27
	91	9	-	-	3	-	-	-	-	-	12	-	-	-	800			12
	94	86	-	-	-	-	-	-	-	-	86	-	-	-	1720			86
	98	24	-	-	-	-	-	-	-	-	24	-	-	-	480			24
Y	87	31	-	-	-	-	-	-	-	-	31	-	-	-	2066			31
	91	14	5	1	6	-	-	2	-	-	28	-	-	-	1866			28
	94	56	-	-	-	-	-	-	-	-	56	-	-	-	1120			56
	98	23	-	-	-	-	-	-	-	-	23	-	-	-	460			23
M	87	36	19	12	-	-	-	-	-	-	64	3	-	-	4466	28	24	67
	91	18	21	1	7	2	-	2	-	-	51	-	-	-	3400	25	24	51
	94	162	43	6	-	-	-	-	-	-	211	-	-	-	4220	24	34	211
	98	15	11	-	-	-	-	-	-	-	26	-	-	-	520	15	23	26
D	87	19	8	1	-	-	-	-	-	-	23	2	-	3	1866			28
	91	23	9	-	10	2	-	2	-	-	36	-	-	10	3066			46
	94	37	33	1	-	-	-	-	-	-	55	-	1	15	1420			71
	98	13	2	-	-	-	-	-	-	-	13	-	-	2	300			15
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	360			18
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	3960			198

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	21%	10%	02%	- 1%
'91	31%	02%	08%	-19%
'94	22%	02%	05%	-81%
'98	20%	00%	03%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	8398	Dec:	22%
'91	8332		37%
'94	6760		21%
'98	1280		23%

Cercocarpus ledifolius																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'87	0	Dec:	-
'91	0		-
'94	0		-
'98	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus																		
S	87	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	7	-	-	-	-	-	-	-	-	7	-	-	-	466			7
	91	3	-	-	-	-	-	1	-	-	4	-	-	-	266			4
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66	8	6	1
	91	2	1	-	-	-	-	-	-	-	3	-	-	-	200	7	7	3
	94	22	7	5	2	-	-	-	-	-	36	-	-	-	720	8	5	36
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	87	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	91	-	1	3	-	-	1	-	-	-	2	-	-	3	333			5
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	+ 8%
'91	17%	33%	25%	- 7%
'94	19%	14%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	732	Dec:	27%
	'91	799		42%
	'94	740		0%
	'98	0		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus																		
S	87	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	91	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	87	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	91	2	-	-	1	-	-	-	-	-	3	-	-	-	200			3
	94	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
	98	25	-	-	-	-	-	-	-	-	25	-	-	-	500			25
M	87	7	-	-	-	-	-	-	-	-	7	-	-	-	466	15	18	7
	91	4	4	-	1	-	-	1	-	-	10	-	-	-	666	6	6	10
	94	71	6	7	2	-	-	-	-	-	86	-	-	-	1720	12	13	86
	98	99	-	-	-	-	-	-	-	-	99	-	-	-	1980	13	16	99
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	1	-	1	-	-	-	-	1	-	1	-	133			2
	94	2	-	1	-	-	-	-	-	-	3	-	-	-	60			3
	98	2	-	-	-	-	-	-	-	-	1	-	-	1	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	+33%
'91	33%	07%	07%	+48%
'94	06%	08%	00%	+24%
'98	00%	00%	.79%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	666	Dec:		0%
'91	999			13%
'94	1920			3%
'98	2520			2%

Echinocereus spp.

Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	9	-	-	-	-	-	-	-	-	9	-	-	-	180	2	3	9

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'87	0	Dec:	-
'91	0		-
'94	0		-
'98	240		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	6	-	-	-	-	-	-	-	-	6	-	-	-	120	8	7	6
	98	6	-	-	-	-	-	-	-	-	6	-	-	-	120	8	9	6

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	+40%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'91	0		-
	'94	120		-
	'98	200		-

Juniperus osteosperma																		
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'91	0		-
	'94	0		-
	'98	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Leptodactylon pungens																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	1	-	-	-	-	-	1	-	-	-	66	9	10	1
	94	36	-	-	-	-	-	1	-	-	37	-	-	-	740	5	8	37
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	9	11	0
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'91	00%	00%	00%	+73%
'94	00%	00%	00%	-89%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		0%
'91	199			0%
'94	740			0%
'98	80			100%

Opuntia spp.																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	4	-	-	-	-	-	-	-	-	4	-	-	-	80	2	60	4
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'87	0	Dec:	-
'91	0		-
'94	80		-
'98	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
S	87	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	91	-	-	-	-	-	-	1	-	-	1	-	-	-	66			1
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	87	-	-	2	-	-	-	-	-	-	2	-	-	-	133			2
	91	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	3	-	2	-	-	-	-	-	-	5	-	-	-	100			5
	98	-	-	-	2	-	-	-	-	-	2	-	-	-	40			2
M	87	-	4	10	-	-	-	-	-	-	14	-	-	-	933	23	29	14
	91	-	-	-	1	1	-	1	-	-	3	-	-	-	200	11	14	3
	94	15	4	2	-	-	-	-	-	-	21	-	-	-	420	28	59	21
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	29	47	0
D	87	1	1	2	-	-	-	-	-	-	4	-	-	-	266			4
	91	-	1	2	2	4	4	6	-	-	8	-	-	11	1266			19
	94	1	18	-	-	1	-	-	-	-	20	-	-	-	400			20
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	160			8

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	25%	70%	00%	+13%
'91	26%	26%	48%	-40%
'94	50%	09%	00%	-96%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	1332	Dec:	20%	
'91	1532		83%	
'94	920		43%	
'98	40		0%	

Symphoricarpos oreophilus																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20	10	11	1
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	13	36	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'87	0	Dec:	-
'91	0		-
'94	20		-
'98	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Tetradymia canescens																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	3	1	-	1	-	-	-	-	-	5	-	-	-	333			5
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	98	3	-	-	1	-	-	-	-	-	4	-	-	-	80			4
M	87	2	-	-	-	-	-	-	-	-	2	-	-	-	133	11	10	2
	91	-	1	-	-	-	-	-	-	-	1	-	-	-	66	4	3	1
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40	3	2	2
	98	3	-	-	-	-	-	-	-	-	3	-	-	-	60	11	12	3
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	+67%
'91	33%	00%	00%	-85%
'94	00%	00%	00%	+57%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	133	Dec:	-
	'91	399		-
	'94	60		-
	'98	140		-